Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Textile Engg.) (2011 Onwards) (Sem.–6)

THEORY OF TEXTILE STRUCTURE

Subject Code : BTTE-601

M.Code : 71735

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a) Show that the weave angle of a jammed structure is 60°.

b) What is the number of weft yarn and warp yarn intersections in a 2×2 twill weave?

c) What is the mathematical expression of fabric thickness?

d) In a staple fibre yarn, state the load sharing mechanism on loading.

e) Compare a real yarn with an ideal one.

f) Give the physical significance of maximum and minimum value of mean fibre position (MFP).

g) How structural mechanics of spun yarn differs from that of continuous filament yarn?

h) What is the expression and meaning of tightness factor of knitted fabric?

i) What is jammed fabric and what is the mathematical condition for it?

j) Define packing coefficient of yarn. State its role in governing structural mechanics of yarn.

SECTION-B

2. In the light of appropriate theory, explain why cotton fibre yarn loses its strength with admixture of polyamide while acetate with same admixture gains it. Also explain the reason behind the difference between the theoretical experimental curves.

3. Explain bending and tensile behavior of woven fabric.

4. Prove that the fractional cover of square jammed fabric is 82%.

5. What is the minimum possible thread spacing or maximum possible threads per centimeter for square jammed fabric (plain) of 30 tex?

6. Deduce the relation between yarn modulus and fibre modulus under small load. Suggest the changes that are required in the relation to make it valid for spun yarns.

SECTION-C

7. What is objective measurement of fabric hand? Explain the FAST method of measurement of fabric quality. How it can be used in product development? 10

8. a) Define fibre migration and also define axial and preferential migration giving suitable sketch. Give the detail of mechanisms involved in migration. 6

   b) Give a comparative assessment of the structure property relationship of ring, rotor spun and air jet spun yarns. 4

9. a) Write short note on knitted fabric GSM and its mathematical expression. 5

   b) Deduce the relation between contraction and retraction in yarn. Also deduce the relation $c_y(c_y - 1) = \frac{1}{4}\tan^2 \alpha$, α being the helix angle and c_y is contraction in yarn. 5

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.